CTC Union Smart View
Element Management System

EMS

The objective of EMS is to provide four major functions for telecommunication operators:

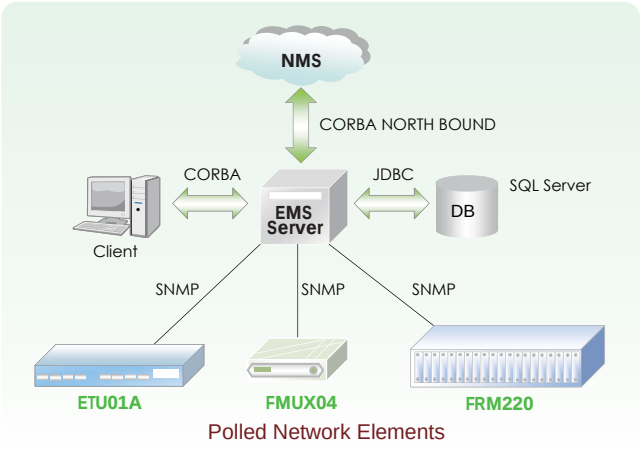
• Fault Management (FM) • Performance Management (PM) • Configuration Management (CM) • Security Management (SM)

The EMS Server is designed to provide all the configuration and maintenance functions for the communication device. The method to access EMS Server functions is via CORBA protocol according OMG CORBA Specification. When a user loads EMS Client software and sets up a link to the EMS Server, it will be possible to monitor and control all network devices via CORBA actions. EMS Server uses SNMP Protocol to monitor and control the network devices via SET GET and TRAP SNMP actions.

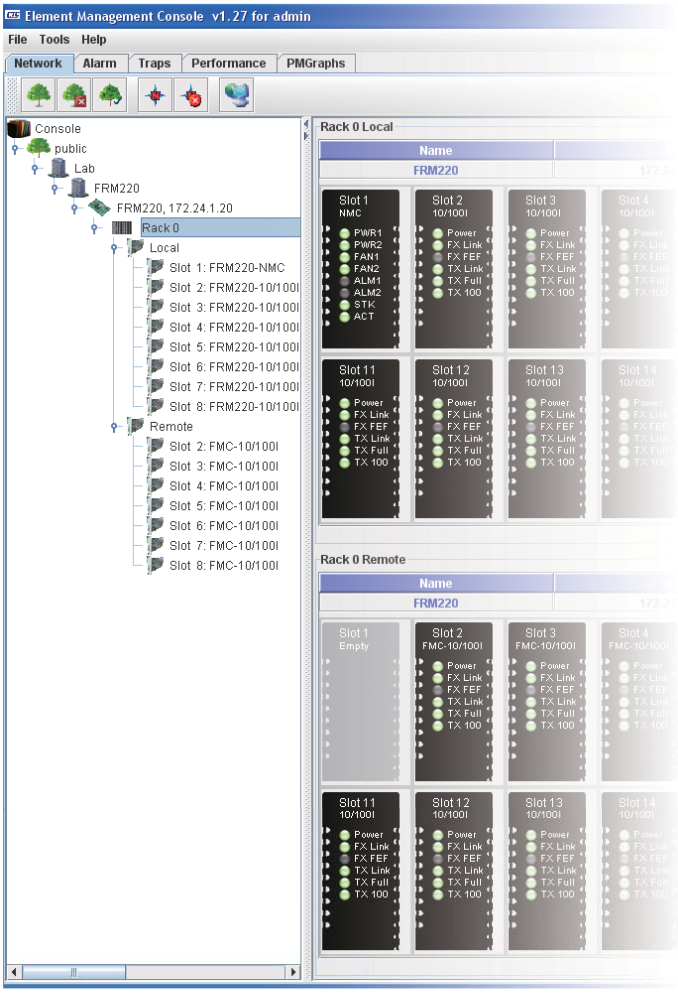
The major tasks include:

1. Collect configuration information from SNMP Agents via SNMP protocol and send to them control commands to change their state.
2. Guarantee storage of all information in external database server
3. Transfer control and configuration data to and from client SW via CORBA
4. Organize and maintain control objects in database and client configuration constructions, which describe system.
5. Provide role access to mentioned above objects

Network Scheme Diagram



Polled Network Elements



Agents

By utilizing a modular design, a large variety of configurations may be realized and the unit may be custom tailored for each specific application.

CORBA Server

CORBA Name Service provides the ORB (Object Request Broker) central component of CORBA. It encompasses the entire communication infrastructure necessary to identify and locate objects, handle connection management, deliver data and is responsible for communication of requests.

EMS server

EMS Server collects the information data from the specific SNMP agents and keeps updating it to the SQL server via the JDBC (Java DataBase Connectivity) driver.

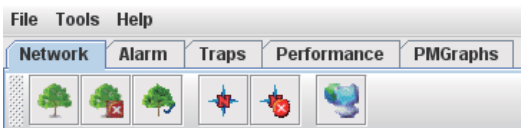
SQL Server

SQL Server is the place where the EMS collected data is stored, The database will store Alarm Trap and all informations.
CTC Union's EMS is compatible with MS-SQL 2000, 2005 and MS-SQL 2005 Express.

Workstation-Clients

Workstations act as clients in the CORBA architecture. They provide the JAVA applet GUI to monitor and control the agents at far end. They also receive the Alarm Traps from the corresponding SNMP AGENTS. Multiple workstations are allowed in this field.

Configure Command Tool Bar



Features

JAVA based
EMS is pure JAVA project and collects all benefits of this technology including multi platform support, module design, and client-server architecture.

Event driven
Using events as primary objects for communication minimizes network loading, increases performance and allows including a given quantity of network devices with predictable CPU and RAM loading, depending on this quantity.

Open architecture
Provides API and IDL files for integration with upper layer NMS systems.

Database support
Support for Microsoft SQL Server 2000,2005&2005 Express
Flexible SQL interface design for server and client optimization by customer.

Data integrity
All data is located in the same place. User profiles are stored to and loaded from one source. User created objects are stored and loaded remotely and/or locally. There are well-defined procedures for backup and restore configuration, topology, alarm and user data.

Standard SNMP and CORBA
support design has no assumption to any CORBA vendor. Tested with different Object Request Brokers.

Installation Screen

CTC Union's SmartView EMS v2.10
Language: English
CTC union
Environment
Install Java Runtime Environment
Install Microsoft SQL Server 2005 Express Edition
Element Management System EMS
SmartView EMS
Install EMS
Upgrade EMS
User Manual
Product Support
Uninstall EMS
Install the Sun Microsystem's Java Runtime Environment. JRE is required to run the core EMS server and EMS client software. JRE installation requires only several minutes.
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EXIT

Available models

- FRM220
- ETU01A,
- FMUX01A,
- FMUX01A/Plus,
- FMUX04,
- SML2000/5000

Requirements

EMS	Hardware	Software	Operating System
EMS Server	P4 1.6G or higher, 512MB RAM, HD >2GB (free)	JAVA JRE. EMS Kit, ODBC Driver	Windows, Linux, BSD
SQL database Server	P4 1.6G or higher, 512MB RAM, HD >2GB (free)	MS-SQL Server 7.0 (or MS-SQL 2000) EMS Kit.	Windows 2000 Pro or Server, Windows 2003 Server, Windows XP, Vista
CORBA Server	PIII 800 or higher, 128MB RAM, HD >1GB (free)	JAVA JRE. EMS Kit	Windows, Linux,
Workstation-Clients	PIII 800 or higher, 128MB RAM, HD >1GB	JAVA JRE. EMS Kit	Windows, Linux,
All-In-One	P4 2.8G or higher, 1GB RAM, HD >10GB (free)	JAVA JRE, EMS kit, MS-SQL Server, ODBC Driver	Windows 2000 Pro or Server, Windows 2003 Server, Windows XP, Vista

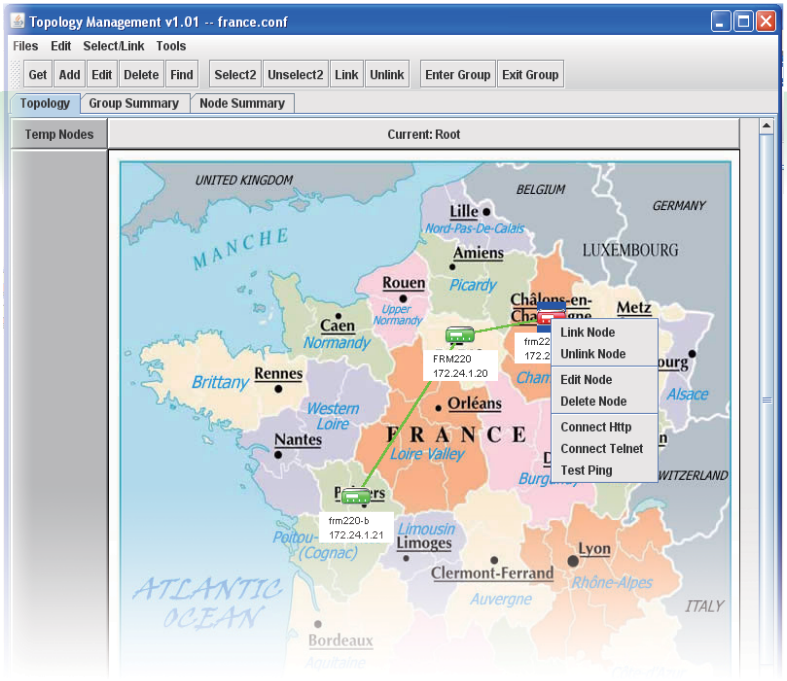
Ordering Information

Model Name	Type	Description
SV-PLF-05	Smart View Platform server	Platform server with 5 client user admission
SV-PLF-25	Smart View Platform server	Platform server with 25 client user admission
SV-PLF-50	Smart View Platform server	Platform server with 50 client user admission
SV-AGT-50	Smart View Device Agents	50 device agents
SV-AGT-100	Smart View Device Agents	100 device agents
SV-AGT-200	Smart View Device Agents	200 device agents
SV-AGT-500	Smart View Device Agents	500 device agents
SV-FOM	Managed Modules	FMUX04, FMUX01A, FMUX01A/Plus managed modules
SV-PDH	Managed Modules	ETU01A managed module; ERM01
SV-Fiber	Managed Modules	FRM220, FRM220A
SV-CWDM	Managed Modules	Sigma Links 5000/2000 managed module

SV – □□□ – □□□
Example: SV – AGT – 100

CTC Union Smart View
Element Management System

EMS Management Functions



Topology

Getting Topology Map node

User can load maps to SQL server, load maps from SQL server or delete attached maps. Download procedure is very simple.

Map area may be used to layout any objects from Root and Node panel.

Using drag-and-drop, put any object to map area. Any label or network element location name may be added to object. Objects in red color indicate some alarm condition is present in the device. Right clicking an object brings a popup window to select Telnet or Http management directly.

Fig. 1: Topology Manager ready to Get Agents

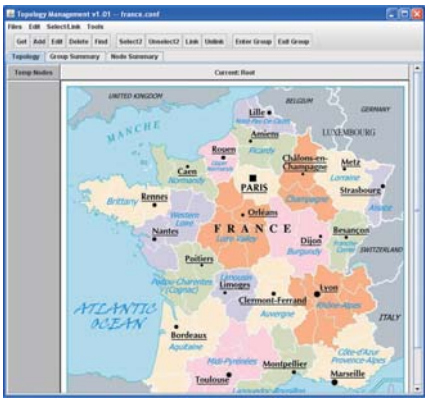
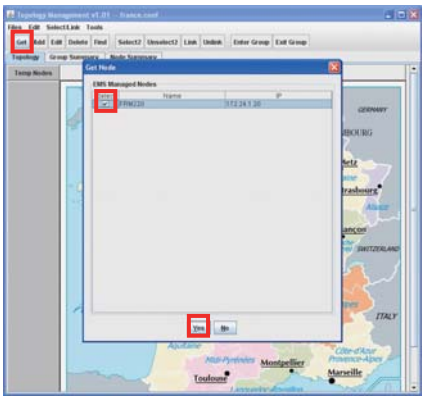
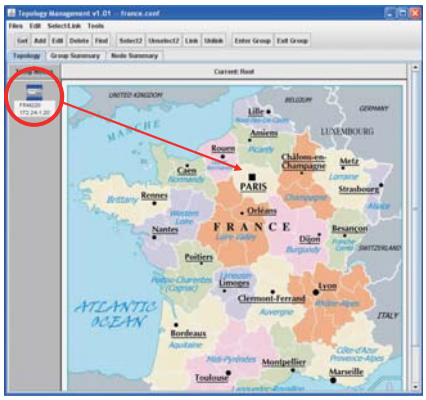


Fig. 2: Topology Manager Get Agents



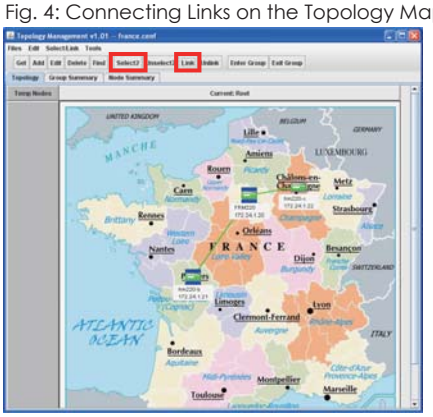
Select all of the nodes you want to include in this map from the 'Topology Management' main window.

Fig.3: Drag Agents into the Topology Map



Drag and Drop Agents

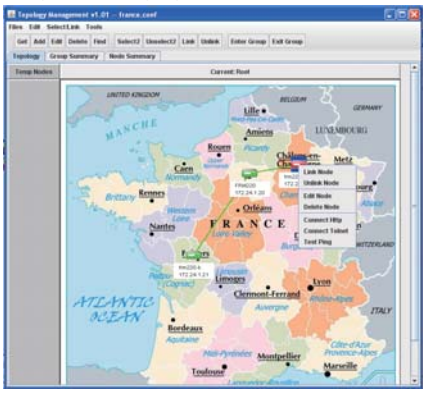
Fig. 4: Connecting Links on the Topology Map



To link two agents together

- First select one of the agents.
- Next click the"Select2" function button.
- Then click on the second Agent.
- When both are highlighted in Blue,
- Click the "Link" function button.

Fig. 5: Managing Alarms



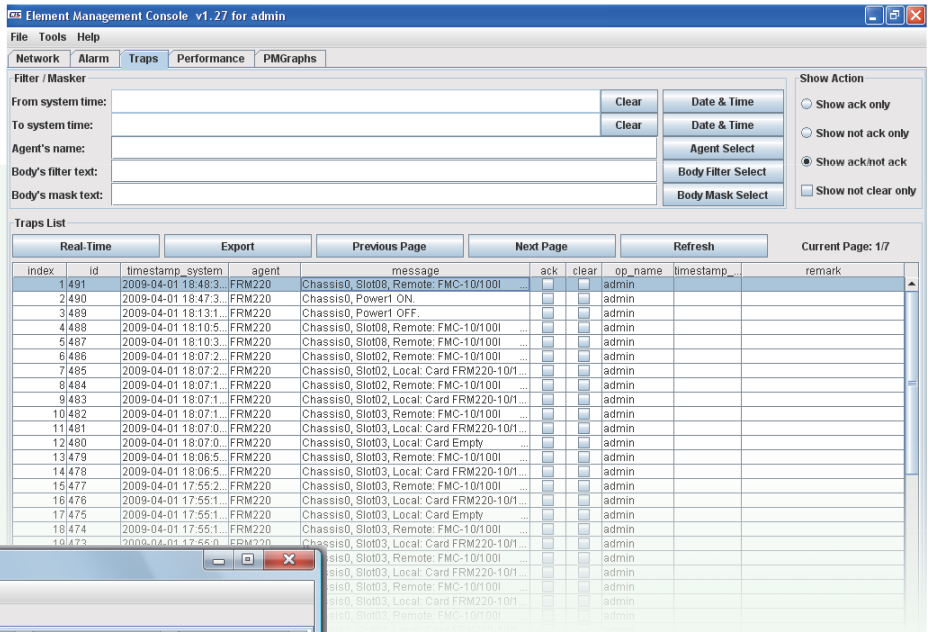
Troubleshooting Alarms

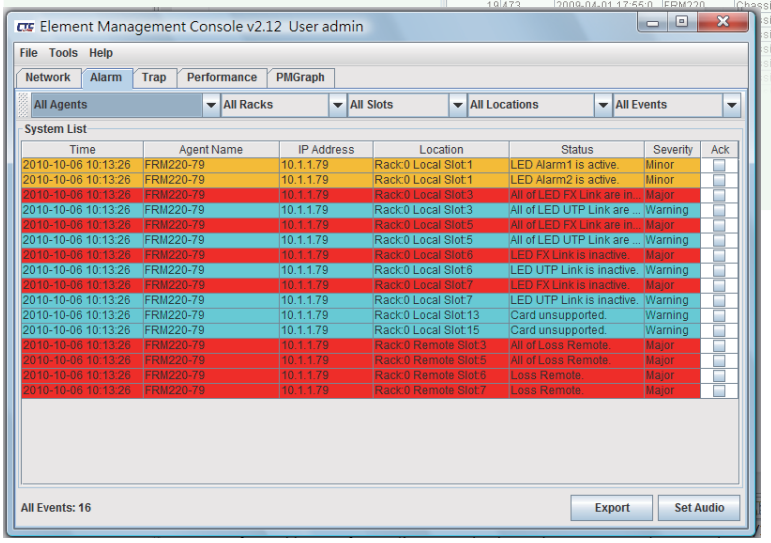
If any Agent experiences an alarm condition, the agent's icon color will change from "Green" to "Red". Use the mouse and 'Right-click' the Agent's icon. The pull-down menu will appear as the Figure5.

Fault Management

Trap List

All alarm traps will be stored in SQL database. In Traps page, press "Auto Refresh" button to get the current alarm trap records in database, and it will update status automatically. Press "Pause" button to halt the screen, then, operator can make "ack" or "clear" action. Press "refresh and save file" to get the current alarm trap records in database and save to "TrapList.txt" file in disk.





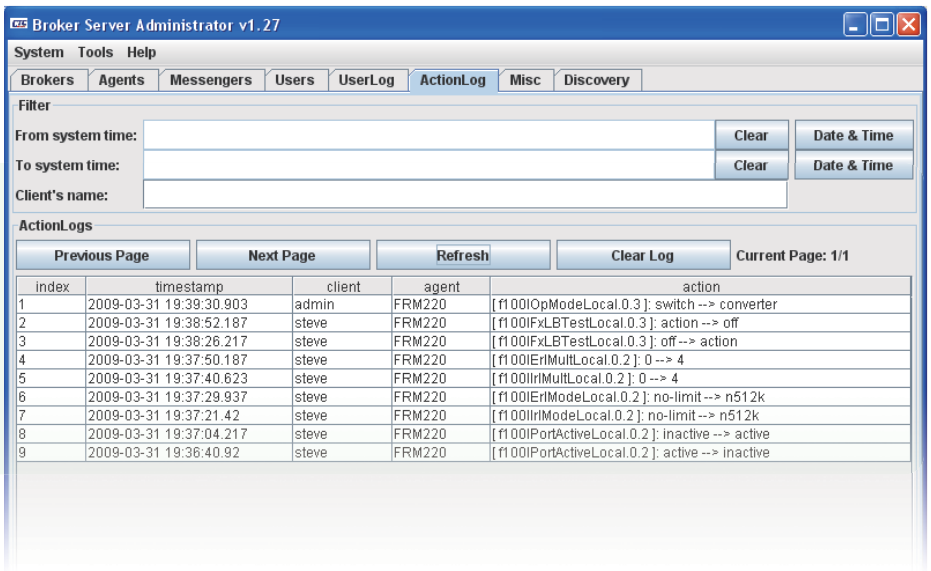
Active Alarm List

On the System tab, you can view all Active Alarm Lists. Three kinds of filters can be applied to alarm list. User may select one agents, local or remote rack, and specific status as filters to watch active alarms. The status filter can be categorize Major, Minor, Warning, and all statuses label or network element location name may be added to object .

Security

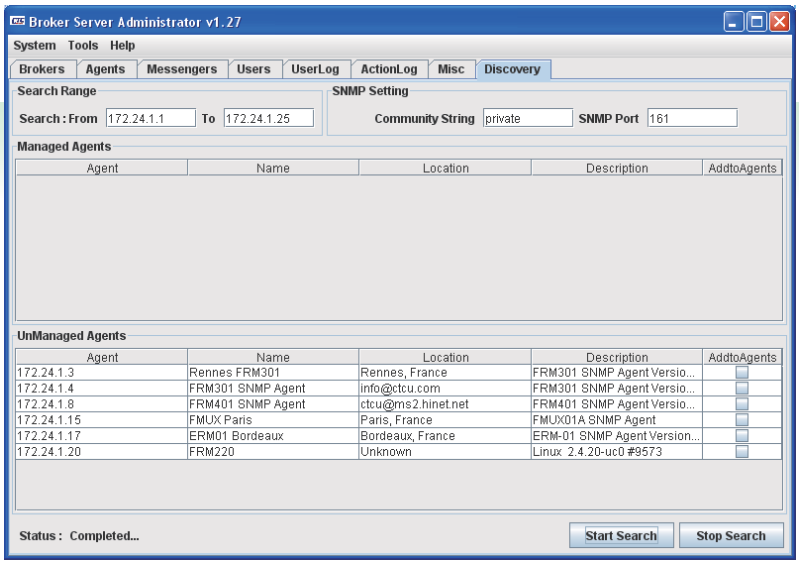
Activity Log

All activities performed on any Network Element are logged with time-stamping, the user making changes and the changes made.


Broker Server Administrator v1.27
System Tools Help
Brokers Agents Messengers Users UserLog ActionLog Misc Discovery
Filter
From system time:
To system time:
Client's name:
Clear
Date & Time
ActionLogs
Previous Page
Next Page
Refresh
Clear Log
Current Page: 1/1
index timestamp client agent action
1 2009-03-31 19:39:30.903 admin FRM220 [f100IOpModeLocal.0.3]: switch --> converter
2 2009-03-31 19:38:52.187 steve FRM220 [f100IFxLBTestLocal.0.3]: action --> off
3 2009-03-31 19:38:26.217 steve FRM220 [f100IFxLBTestLocal.0.3]: off --> action
4 2009-03-31 19:37:50.187 steve FRM220 [f100IErlMultLocal.0.2]: 0 --> 4
5 2009-03-31 19:37:40.623 steve FRM220 [f100IIrlMultLocal.0.2]: 0 --> 4
6 2009-03-31 19:37:29.937 steve FRM220 [f100IErlModeLocal.0.2]: no-limit --> n512k
7 2009-03-31 19:37:21.42 steve FRM220 [f100IIrlModeLocal.0.2]: no-limit --> n512k
8 2009-03-31 19:37:04.217 steve FRM220 [f100IPortActiveLocal.0.2]: inactive --> active
9 2009-03-31 19:36:40.92 steve FRM220 [f100IPortActiveLocal.0.2]: active --> inactive

CTC Union Smart View
Element Management System

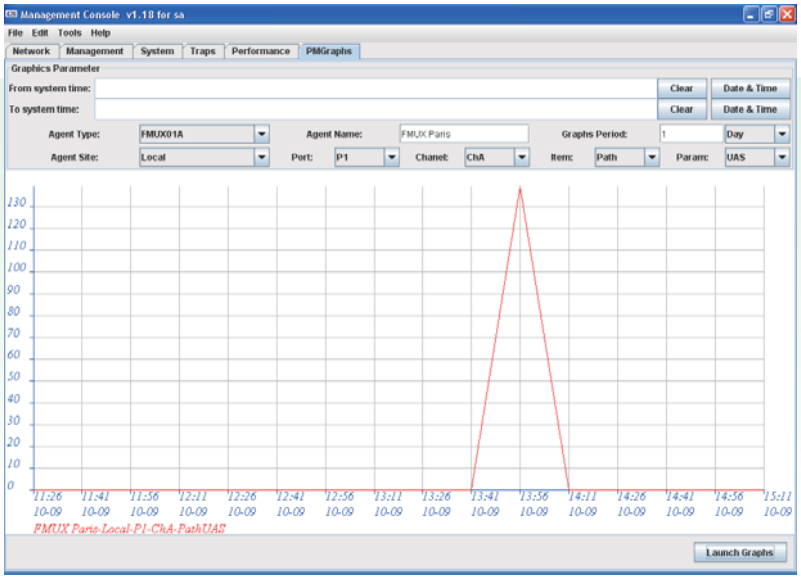
EMS Management Functions


Broker Server Administrator v1.27
System Tools Help
Brokers Agents Messengers Users UserLog ActionLog Misc Discovery
Search Range
Search : From 172.24.1.1 To 172.24.1.25
SNMP Setting
Community String private SNMP Port 161
Managed Agents
Agent Name Location Description AddtoAgents
UnManaged Agents
Agent Name Location Description AddtoAgents
172.24.1.3 Rennes FRM301 Rennes, France FRM301 SNMP Agent Versio...
172.24.1.4 FRM301 SNMP Agent info@ctcu.com FRM301 SNMP Agent Versio...
172.24.1.8 FRM401 SNMP Agent ctcu@ms2.hinet.net FRM401 SNMP Agent Versio...
172.24.1.15 FMUX Paris Paris, France FMUX01A SNMP Agent
172.24.1.17 ERM01 Bordeaux Bordeaux, France ERM-01 SNMP Agent Version...
172.24.1.20 FRM220 Unknown Linux 2.4.20-uc0 #9573
Status : Completed...
Start Search
Stop Search

Management & Alerts

Network Element Discovery

The EMS has a tool for automatically discovering SNMP agents on the network. Simply enter an IP address range and the discovery program will ping every IP address looking for SNMP agents. Once discovered, the agents can be selected and brought into the broker for polling.

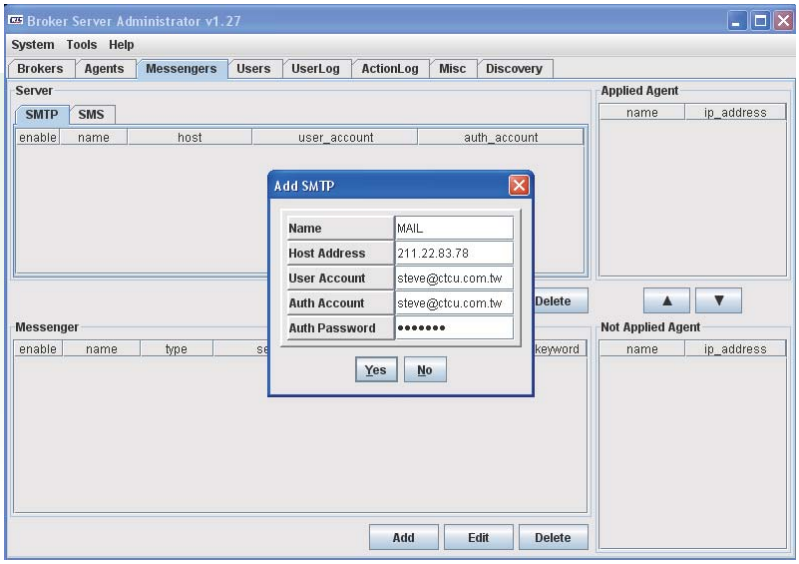


Performance Monitoring

Device performance is plotted over time using standard PM data such as ES, UAS, etc. PM data is typically only available for PDH devices such as the ETU01A and ERM01.

Alarms sent by E-mail & SMS

The EMS is capable of sending emails and or SMS text messages to selected administrators when critical alarms occur. Prompt notification of system problems aid in getting problems in the network fixed in the shortest time possible.



Management System - Graphical User Interface

FRM220-NMC

The Web GUI of FRM220-NMC behaves just like any other web based application. The following graphic (Figure 3.1) shows all of the areas that may be clicked for further configuration. Slots without any line card or without manageable line card will be shown as 'Empty'.

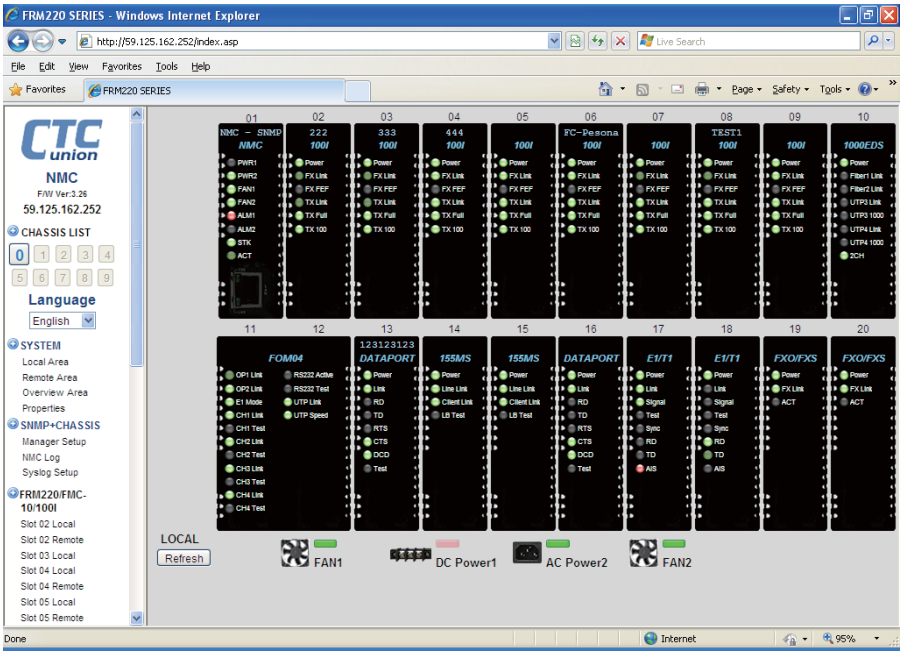


Figure 3.1 Selectable features of the Main Web GUI

Chassis List

Use the "Chassis List" control to select the chassis in the cascade group. Using only one IP address and one single point of management, up to 10 chassis (ID 0~9) can be managed.

Language

The NMC currently supports four different language interfaces; English, Simplified Chinese, Traditional Chinese and Japanese user interfaces.

System Information

Clicking on the "System" item will display an overview screen (Figure 3.2) that allows setting system information, TFTP kernel and file system update, date & time setting, and parameter management.

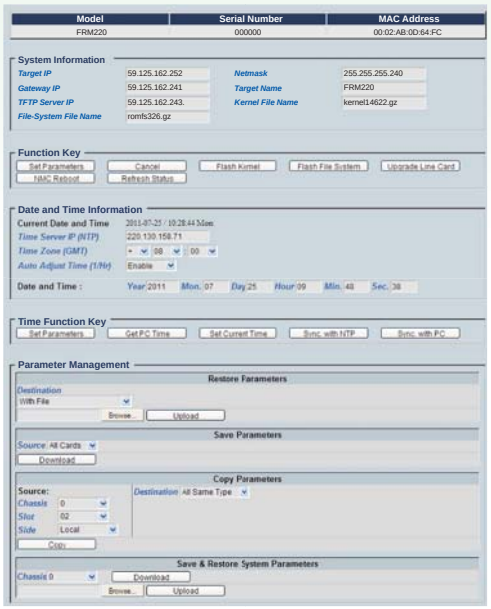


Figure 3.2 System Information

SNMP + Chassis

Click on "SNMP+Chassis" from the left hand window menu bar.

Header

The top header of Figure 3.3 displays the chassis ID (0 for the master chassis, 1~9 for cascaded slave chassis), the slot number for NMC is always 1, NMC is always in local and the version displayed in the format h/w-s/w. In the below example, the NMC hardware version is 1.0 while the software version is 3.263 and kernel build 14622.

Chassis Information

The Chassis Information group displays the power supply types and the power and fan status. There are slots for installing one or two power modules. They may hold either AC or DC type modules. Power 1 refers to the module installed in the left slot as viewed from the rear of the chassis, while Power 2 refers to the right slot. An OK status indicates the power module is working within normal parameters. Fan status is indicated with both the current RPM (speed) of the cooling fans and with a status of OK or Failed. If the RPM of the fan falls below 1650RPM, a failed status will be indicated.

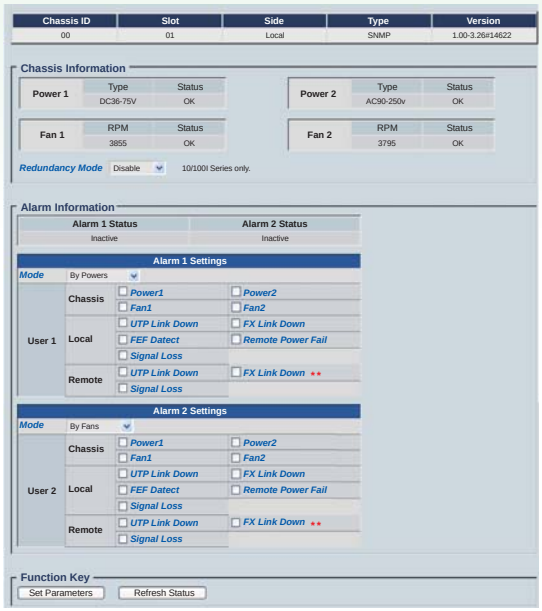


Figure 3.3 SNMP+Chassis Information

Management System - Graphical User Interface

FRM220A-GSW/SNMP

The Web GUI of FRM220A-GSW/SNMP behaves just like any other web based application. The following graphic (Figure 3.4) shows all of the areas that may be clicked for further configuration. Slots without any line card or without manageable line card will be shown as 'Empty'.

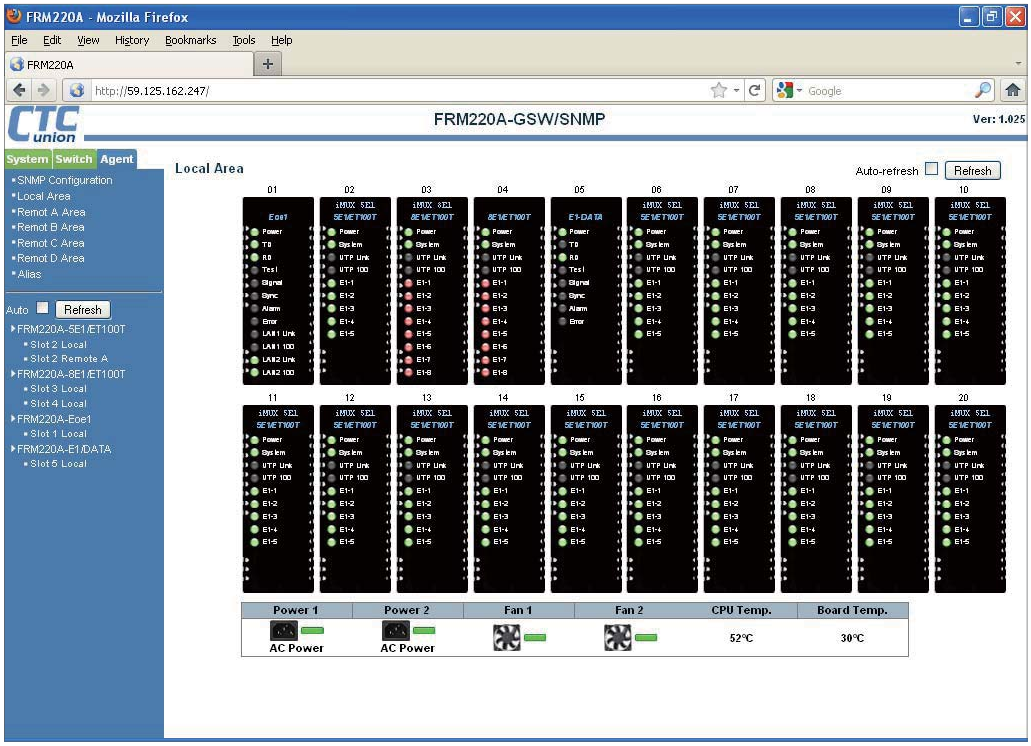


Figure 3.4 Selectable features of the Main Web GUI

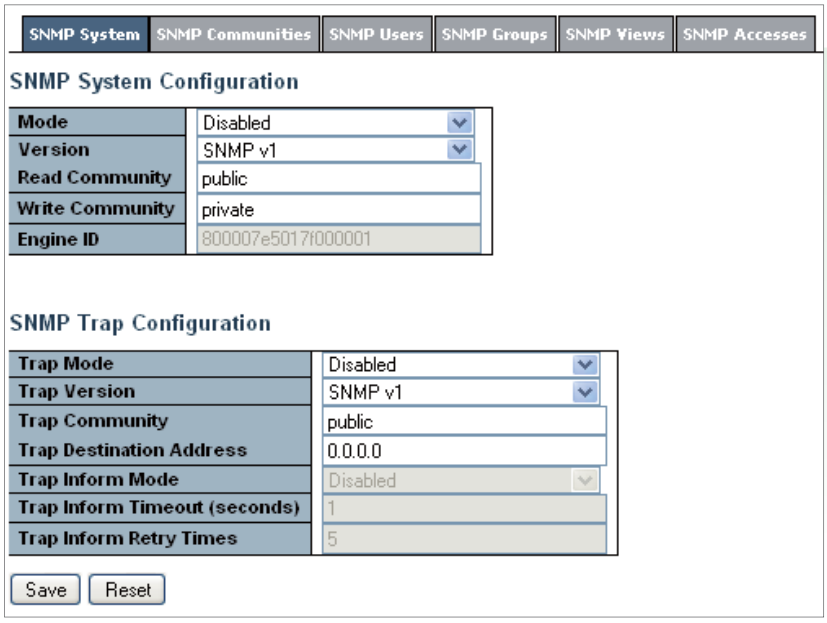


Figure 3.5 SNMP System Information

Alias Configuration

The Alias panel configuration allows for up to 10 ASCII characters to describe each of the local twenty slots as well as remote in-band connected converters. The names are then displayed for each card on the home page graphic.

SNMP Configuration

Clicking on the **"SNMP Configuration"** item will display an overview screen that allows setting the SNMP system information(Figure 3.5), including enabling the mode, selecting SNMP version, setting up trap management and configuring community strings.

Local/Remote Area

"Local Area"(Figure 3.6) will display a graphic representation of all the cards inserted in the chassis and the real-time status of all LEDs (this display is also the default 'Home' page of the web interface).

The graphic indicators at the bottom of the display show the real-time status of the two Power Modules, the two chassis fans and temperature. An error in any of these will result in the effected icon's LED blinking in RED.

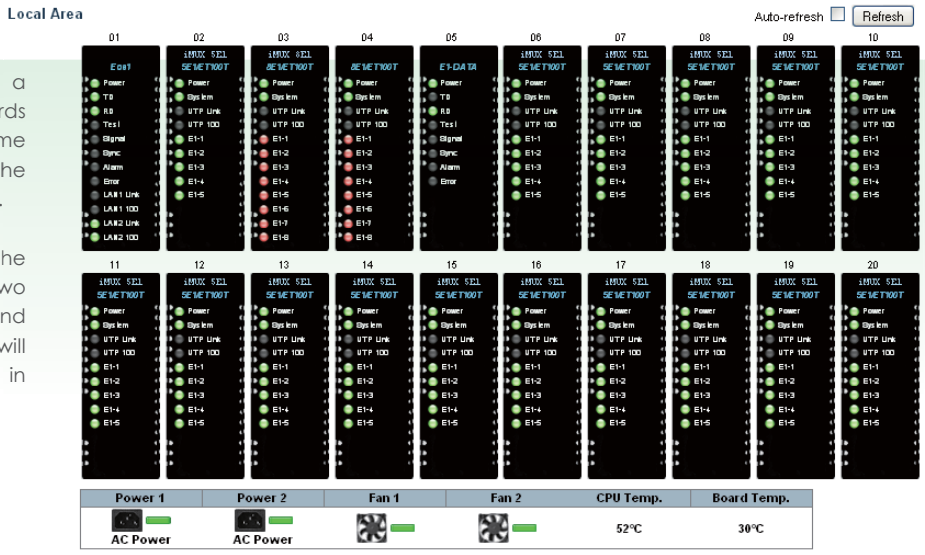


Figure 3.6 The real-time status of installation Card, Power Module and Fan.

System

The system settings include informational as well as configuration setting.

Information
Information about the system is displayed here, including the hardware version, the MAC address, firmware versions and software version information

Configuration
System information includes the MIB-2 variables for contact, name and location of the system.

IP Setup
The IP Setup provides the web based method to change the IP address, subnet mask, default gateway and the VLAN ID.

Date and Time
The Date & Time Setup provides the web based method to change the system time and configure SNTP time synchronization.

Password Setup
Enter the old password, if there is one, and enter new password twice.

Monitor
The Monitor screen will display system information for the type and status of Power 1 and Power 2, the fans status and RPM, the GSW CPU temperature and the GSW card board temperature (in Centigrade).

Alarm Setup
The Alarm screen will display current alarm status. Inactive means there are currently no alarms. Active means an alarm condition exists.

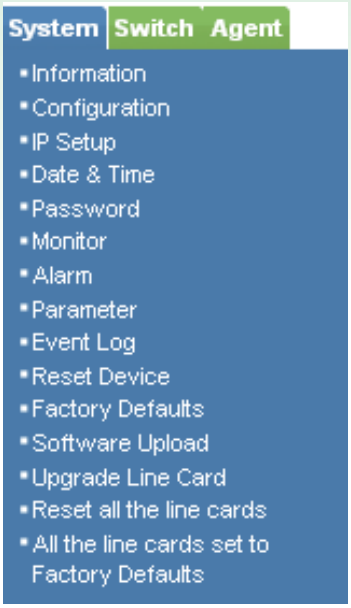
Parameters
The GSW/SNMP has backup and restore functions that work at a card level (backup individual card or all cards to PC, or restore parameters from a backup file on PC to single card or all other like cards).

Event Log
The event log keeps a running record of events that happen in the FRM220A-GSW/SNMP, including cards inserted/removed, card faults, power or fan faults, and remote login/logouts.

Reset Device
The reset device function will do a warm reboot of the GSW CPU/Switch.

Factory Defaults
The Factory Default function will return all configurations (except for the TCP/IP settings) to their factory defaults.

Software Upload
The Software Update function is the easy method to upgrade the operational software for the GSW/SNMP.



Upgrade Line Card
The Update Line Card function is the easy method to upgrade any of the line cards installed in the FRM220A CH20 chassis (except the 1000EAS/X).

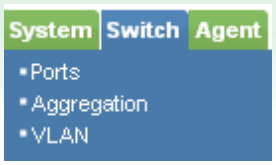
Reset All Line Cards
The reset all line cards function will do a warm reboot of all line cards installed and recognized in the 220A.

All Line Cards Set to Factory Default
The set all line cards to factory default function will return each installed card to its original factory default settings.

Switch

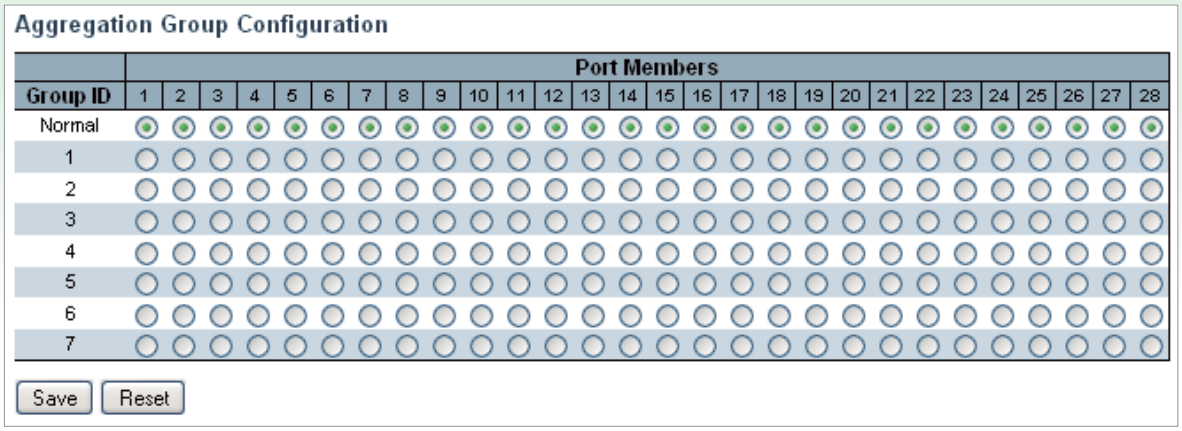
Ports

The 'Ports State Overview' screen will display the link status for all ports of the L2 switch. The indicators 1~20 refer to the CH20 slots 1~20, as viewed from the front of the chassis, numbered from left to right. Ports 21~24 are 10/100/1000 Base-T ports available at the rear of the CH20 chassis, located on the GSW/SNMP plug-in card. The additional ports 25~28 are SFP optical based and may be 1000Base-FX or 2500-FX.



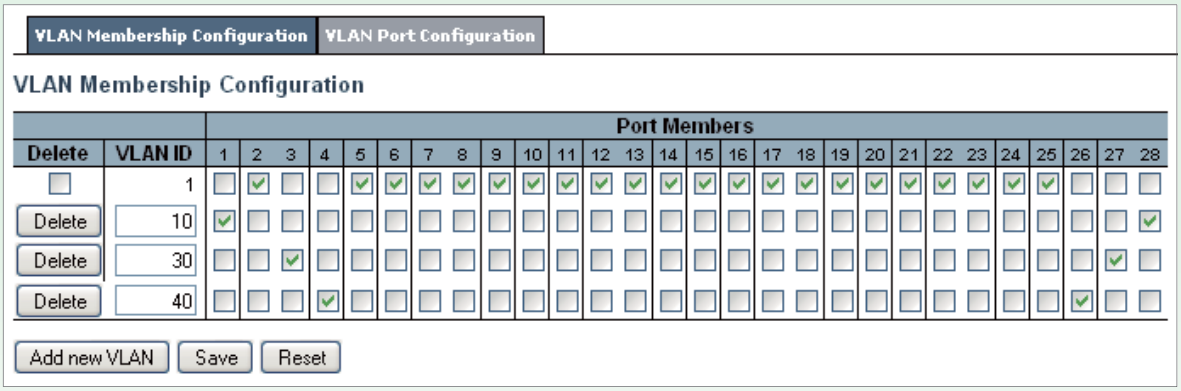
Aggregation

There are 8 aggregation groups that can be assigned any of the 28 available ports. A port can only be assigned to one group.



VLAN

VLAN Membership Configuration



VLAN Port Configuration